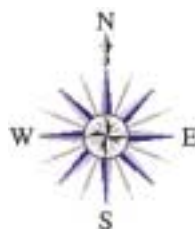


Safe Port VTS

port Vessel Traffic Services
radar and GPS-transponder data-link



Introduction



These needs are met through the *Safe-Port*, a complete Port Traffic Management System. The modules are based on the new Raytheon Pathfinder®/ MK 2 Radar and the successful SML Technology Ltd PC based offshore radar and transponder tracking system, comprising *Safe-Lookout* remote radar management, *Safe-Navigator* VTS display workstation and *Safe-ID* GPS-transponder data-link.

IMO / IALA approved definition of VTS

»A VTS is a service implemented by a competent authority, designed to improve safety and efficiency of vessel traffic and to protect the environment. The service should have the capability to interact with the traffic and to respond to traffic situations developing in the VTS area«

VTS systems were traditionally associated with high cost radar and computer packages, their price and complexity made them solely the domain of the larger ports. Today, SML Technology Ltd and Raytheon radar have redefined the concept of VTS through low cost, innovative solutions designed to meet the requirements and budget of any size of port.

This partnership has brought together Raytheon's state-of-the-art, commercial marine radar of unrivalled performance and reliability with SML Technology Ltd VTS display workstation, running on a standard PC, operating under Windows NT®.

The harbour master is responsible for the economic and safe movement of transiting vessels, as well as the enforcement of local regulatory compliance. Together with the need for optimum utilization of port craft such as pilot boats, this requires a real-time overview of all movements within the port VTS area, necessary to provide the right information for decision making and to help ensure correct action is taken. In addition to the operational benefit of knowing the precise location of port craft there is also an added safety benefit in that their positions are known to the controller at all times – important in today's increasingly legislated port safety regime.

Applications

As well as Port VTS applications and waterway management, the system is already well established in the offshore industry with twenty VTS *Guard-Zone* oil-platform protection systems already installed and fully operational.

Applications for coastal surveillance and zone protection systems include:

- Port VTS and Coastal VTS
- Sub-sea telecommunication and power cable protection
- Sub-sea gas and oil pipelines
- Search and Rescue
- Coastal resources and EEZ monitoring
- Drill ship operations
- Coast Guard
- Customs
- Navy
- Firing-range safety

VTS System



PC based VTS display workstation

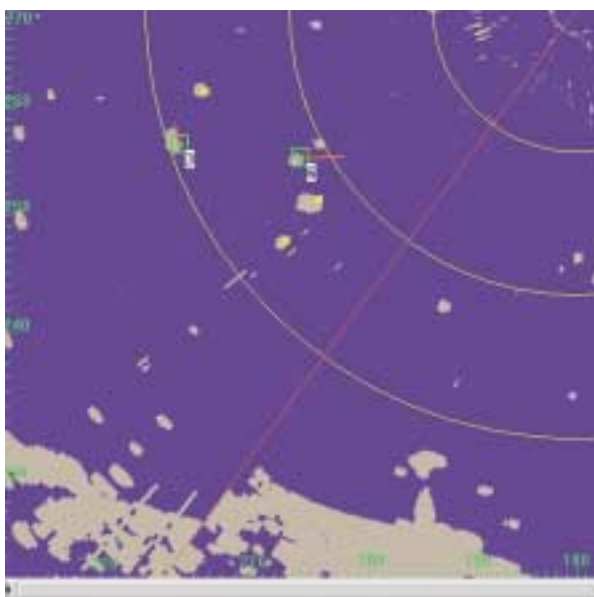


X-band antenna / transceiver



Modular system

The **PC based VTS display workstation**, operating under Windows NT® displays a radar window and composite display of radar tracks from all radar heads, plus transponder tracks, presented on an electronic chart. Choice of official ARCS or NOAA raster charts and S57 (edition 3) official vector charts, plus PC "raw-radar" window and VTS toolset. Provides multiple target tracking, CPA, TCPA collision threat alarms, guard zones and



Raw-radar window

speed zones etc., all configurable by the controller. Built in recording function allows playback display for later analysis of incidents and all manner of zone incursion and speed violations. Can be time synchronised to playback of VHF radio and telephone recorder.

Local radar installed at the control room site provides coverage of the inner port area.

Remotely sited radar-head to provide optimum coverage of the approaches to the port and immediate coastal area.

The radar management enclosure provides the interface to the radar-head, allowing BITE and all the usual radar controls including FTC and STC, to be operated from port control. Advanced radar video processing with CFAR provides optimal adjustment for track extraction. Remote radar sites are connected to port control by micro-wave link.



Radar Management Enclosure

Safe-ID is a state-of-the-art GPS-transponder and high speed data-link operating at 9,600 Baud, operating on UHF, or maritime band VHF; utilizing TDMA protocol and GPS time synchronization.

Fitted to harbour craft such as pilot boats, workboats, RIBs etc, it will enable their tracks to be viewed on the VTS display at port control. In addition to basic GPS transponder operation the data-link is used to broadcast GPS differential corrections to mobiles. With the addition of a plug-in laptop or ruggedized display, the coxswain can also view radar tracks from port VTS radar and exchange Email messages with the controller.



Pilot boat display



Pilot boat

- **Keep track of pilot boats and other port craft**

Safe-ID improves the efficiency and safety of pilot boat operations, by providing the controller with real time track data of all his craft, overlaid together with radar tracks onto an electronic navigation chart of the area. All can be recorded for playback and analysis at a later date.

- **Onboard display of radar tracks from port radar**

The onboard plug-in display provides the coxswain with a complete traffic image, with his own vessel centre-screen. Tracks of other transponder fitted port craft, fused with radar tracks from port VTS radar are all broadcast on the *Safe-ID* data-link.



GPS-transponder

- **Email messaging reduces VHF radio exchanges and paperwork**

Operational messages can be exchanged between port craft and port control, via their terminals. These could include pilot boarding lists, other automated records and at the base station a link into the port accounting software. Metrological and hydrographic data can also be broadcast to mobiles.

- **MOB (Man Overboard) alarm-alerting**

The optional 121.5 MHz alarm / repeater unit fitted to *Safe-ID* raises the alarm in seconds from an activated PLB (Personal Locator Beacons). The whole port area is secured in a "closed loop" system, comprising MOB alarm receivers, VHF homer DF and GPS transponders fitted to port craft. All are interconnected by the radio data-link of *Safe-ID*.

- **Differential GPS accuracy**

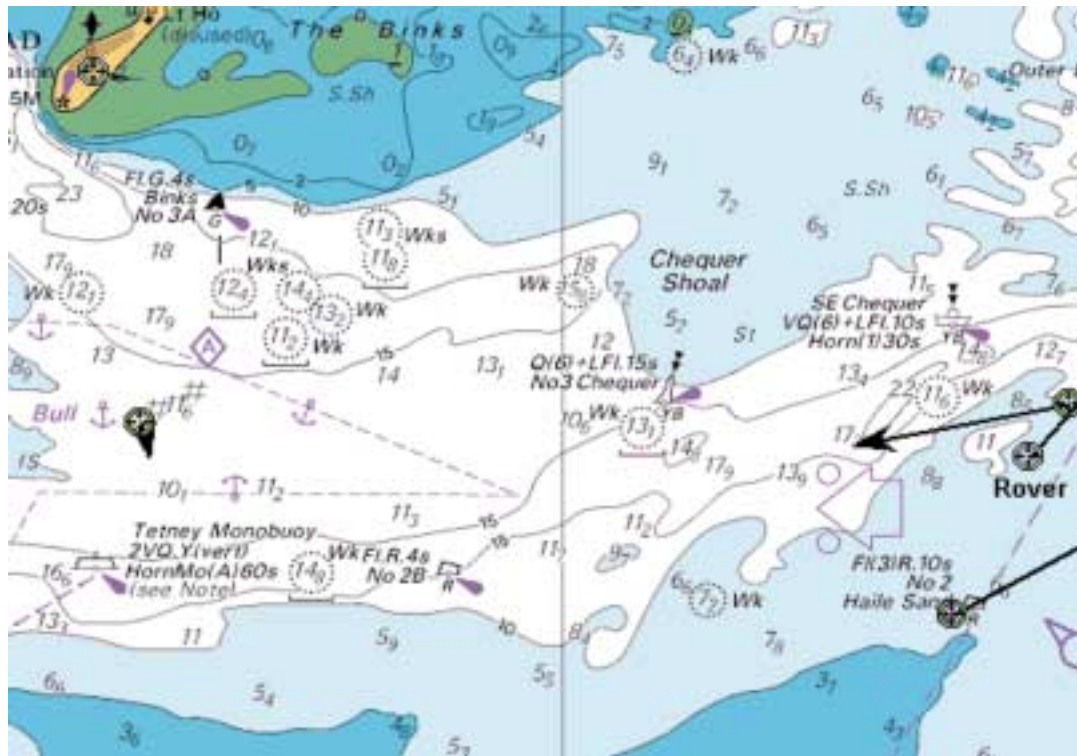
The transponder base station broadcasts GPS differential corrections, derived from either its integral delta correction, or from an external differential receiver. Positioning accuracy of mobiles at differential GPS accuracy is absolutely necessary for tracking in estuarial and port areas.

A range of maritime band VHF base station radio fulfils the communication needs of every type of port.

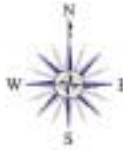
Benefits



- Real-time traffic image of all vessels and port craft in the VTS area, presented against the backdrop of an electronic navigation chart.
- Radar target tracking and plotting functionality customised for shore based VTS surveillance radar applications.
- Track identification labels of up to 500 radar and GPS-transponder targets.
- Differential GPS positioning accuracy for transponder equipped port craft, enhanced by overlay of radar targets broadcast from Port VTS radar, via the transponder data-link.
- Records the movements of visiting vessels and port craft, for later analysis or proof in a dispute.
- Movement data recording synchronised to VHF radio and telephone voice recordings.



- Passing of Email messages; mobile to base and base to mobile, for example pilot boarding lists and operational messages, without reliance on overloaded port operations VHF channels.
- One VTS workstation forms a central display for all connected sensor information such as met and hydro instruments, thus eliminating multiple PC display units scattered around the port control centre.
- Major contribution to port safety.



Company Profile



SML Technology Ltd is a high technology company, supplying electronic chart displays, radar and GPS-transponder systems, to the offshore oil industry, Port VTS and military customers.

The company mission is to provide low cost innovative solutions, with an emphasis on safety-related features.

To realize this goal the company made an early decision to develop software to run on standard PCs operating under Windows NT®. The wisdom of this choice is borne out with a product portfolio of VTS workstations, track-managers and radar controllers costing half that of traditional VTS products.

SML Technology Ltd was formed in 1995 with facilities at Aberdeen in Scotland and Portsmouth in the South of England. The company has an impressive list of customers including most of the major oil companies and many large international electronic companies. With twentyfive Vessel Traffic Management Systems and 250 plus GPS-transponders operating successfully throughout Europe and Asia, SML Technology Ltd is now recognized as a specialist provider of vessel tracking systems.

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